United States Environmental Protection Agency

Region 10

STATEMENT OF BASIS
PROPOSED RCRA REMEDY SELECTION

UNIVAR USA INC.
PORTLAND, OREGON

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1.0 EXECUTIVE SUMMARY

This document presents the Statement of Basis for the Environmental Protection Agency, Region 10's (EPA's) recommended corrective measure pursuant to Administrative Order on Consent 1087-10-18-3008 (AOC) under the Resource Conservation and Recovery Act (RCRA) at the Univar (formerly Van Waters and Rogers) Facility. Univar is located at 3950 NW Yeon Avenue, Portland, Oregon (see Figure 1). This Statement of Basis provides background information and discusses the corrective actions which have been conducted to date, media-specific cleanup objectives, corrective measures alternatives evaluated and the final corrective measure that EPA is proposing to ensure that human health and the environment are protected. Upon conclusion of the public comment period, EPA will issue a final determination and, if significant comments are received, a Response to Comments

The purpose of the corrective action process at the Univar facility is to identify releases or potential releases of hazardous waste or constituents requiring investigation and potential cleanup. These investigations evaluate the nature and extent of releases. The purpose of the corrective action process is also to identify, develop, and implement appropriate corrective action measures to protect human health and the environment.

Univar packages, stores and distributes bulk chemicals at the facility. The facility has been in operation since 1947. From 1973 to 1987 the facility also recycled spent solvents. Four chemical releases at the facility were reported between 1979 and 1985. Chemicals that were released included trichloroethene (TCE), methylene chloride (MC) and mineral acid. In addition, several small releases of chemicals have occurred at the facility during chemical handling and transfer activities.

Investigations begun by the Facility in 1986 detected releases of hazardous constituents to soils and ground water. Constituents that were detected in soil included: tetrachloroethene (also known as PCE), trichloroethene (TCE), 1,1,1-trichloroethane (TCA), 1,2-dichloroethene (1,2-DCE) vinyl chloride and methylene chloride (MC). Constituents detected in ground water included: benzene, toluene, ethyl benzene, xylene, PCE, TCE, DCE, TCA, vinyl chloride and MC.

On June 15, 1988 Van Waters and Rogers and EPA entered into an AOC pursuant to Section 3008(h) of RCRA to address the releases. The provisions and requirements of the AOC, along with other relevant RCRA regulations and guidance, provided the basis for RCRA environmental activities at the facility including the RCRA Facility Investigation (RFI), interim corrective measures (ICMs), and the performance of the Corrective Measures Study (CMS).

Univar has implemented several interim corrective measures (ICMs) since 1992, including construction of a small scale soil vapor extraction (SVE) system to clean up subsurface soil, and a groundwater extraction system at the perimeter of the groundwater plume to control groundwater contaminant migration. Univar submitted the RFI Report to EPA in 1993 and the Final Draft of the CMS in May 2006.

This Statement of Basis is prepared pursuant to Paragraph 23 of the AOC. Under Paragraph 23, EPA must make available for public review and comment, the RFI Report, the Draft CMS Report, and the corrective measure recommendation.

The Statement of Basis summarizes information that can be found in greater detail in the RFI and CMS Reports and in other pertinent documents contained in the Administrative Record. EPA encourages the public to review these documents in order to gain a more comprehensive understanding of the Univar Facility and the RCRA activities that have been conducted there. Accordingly, they are being made available for public review during the public comment period, from ** through **. The locations of these documents and the address for submitting written comments are provided in the last section of this Statement of Basis. EPA may modify the proposed corrective measure described herein or select another corrective action alternative based on new information or on public comments. Therefore the public is encouraged to review and comment on all the corrective action alternatives described in this document.

2.0 FACILITY BACKGROUND

2.1 Site Description and History

The Univar facility is located at 3950 NW Yeon Avenue in a heavily industrialized area northwest of downtown Portland, Oregon **(Figure 1)**. The facility encompasses approximately 9.5 acres, including approximately 2 acres of warehouses and office space, a railroad spur, loading dock, and aboveground storage tanks **(Figure 2)**. More than 90 percent of the site is capped with buildings, the concrete loading dock area, and asphalted apron and parking areas.

The site is zoned heavy industrial and lies within an area designated as an Industrial Sanctuary in the City of Portland Comprehensive Plan. Facilities near the Univar site include American Steel, the McWhorter facility (also known as McCloskey Varnish), and the Equilon (formerly Texaco) petroleum tank farm to the west; Container Recovery Inc. and the former ANR facility to the east and southeast; and the Index and Wilhelm Trucking facilities to the south. The area has been industrialized for approximately 60 years.

Univar (also formerly known as Van Waters and Rogers Inc., and Vopak USA Inc) has packaged, stored, and distributed bulk chemicals at the facility since 1947. Bulk chemicals were stored in 13 underground storage tanks, all of which were removed in 1985. At the time of removal, the tanks were tested and found to be tight. No soil sampling was conducted as part of the removal.

Univar began the recycling of spent chlorinated solvents in 1973, together with the storage in barrels and containers of certain hazardous wastes associated with the recycling facility. The recycling and storage of associated hazardous waste were suspended in 1987. Hazardous waste storage operations closed in 1988.

Four chemical releases at the facility were reported between 1979 and 1985. These included a TCE release immediately south of the former recycling area, a release of a blend of MC and toluene adjacent to the loading dock near the drum fill area, a MC release adjacent to the loading dock south of the drum fill area, and a mineral acid release on the east side of the facility northeast of the fill shed.

In July 1986 EPA issued a Unilateral Order to Van Waters and Rogers under Section 3013 of RCRA to conduct an investigation of soil and groundwater at the facility. This investigation was conducted in two phases in 1987 by Van Waters and Rogers under this Unilateral Order. The results of the investigation were incorporated as part of the RFI Report submitted under the current AOC. The Unilateral Order was terminated by EPA in April 1988.

On June 15, 1988 Van Waters and Rogers and EPA entered into an AOC pursuant to Section 3008(h) of RCRA to address the chemical releases by conducting a RFI, CMS and ICMs.

Univar has implemented a number of ICMs beginning in 1992 with a pilot-scale soil vapor extraction (SVE) system. More recently, an on-site groundwater ICM, consisting of three groundwater extraction wells was installed during late 2001 and early 2002. The groundwater ICM began operations in March 2002. The groundwater ICM provides hydraulic control of the groundwater contamination at north and south ends of the plume perimeter and removes contaminant mass. The extracted groundwater is treated by air stripping, and off-gases from the air stripper are treated by resin adsorption. Integrating the ICM into the final corrective measure for the site is an important component of the final corrective action proposed for the site.

A groundwater beneficial use evaluation was performed in April 1999 (EMCON, 1999a). Based on the long-term heavy industrial use of the area around the Univar facility, the lack of historical and current groundwater use near the facility, the generally low background quality of shallow groundwater in the area, the abundant supply of high quality water from the Portland Water Bureau, and the lack of future planned groundwater use in the area, Univar concluded, and EPA concurred that there are no current or reasonably likely beneficial uses of groundwater in the vicinity of the facility. Therefore, direct use of the groundwater in the vicinity of the Univar facility (e.g., drinking water, industrial use) are not complete exposure pathways and were not evaluated as part of the CMS. However, prevention of groundwater contaminant migration to downgradient surface water is a corrective action objective.

The majority of the draft CMS report was submitted to EPA in September 2001. The final portions of the draft CMS report were submitted to EPA on January 9, 2002. Following resolution of several technical issues, Univar submitted a revised CMS report on February 19, 2004. Following receipt of several additional comments from EPA, Univar submitted a "redline" of the February 2004 CMS report to EPA via e-mail on June 18, 2004. EPA approved the "redline" version of the CMS as a draft final document in a April 21, 2006 letter (EPA 2006). Based on this approval, Univar submitted the

Final Draft CMS Report to EPA on May 22, 2006. The recommendations contained in this report are discussed in Section 6.

2.2 <u>Site Geology and Hydrogeology</u>

The Univar facility is located on the Willamette River floodplain approximately 2,200 feet south of the river and 1,000 feet north and northeast of the Tualatin Mountains. The floodplain near the facility is underlain by artificial fill, Quaternary alluvial and lacustrine deposits, the Pliocene Troutdale Formation, and Tertiary Columbia River Basalts (from youngest to oldest). The shallowest aquifer in the area consists of Quaternary alluvial and lacustrine deposits. Based on site characterization investigations performed at industrial facilities in the area, depth to groundwater ranges from less than 10 feet to 20 feet below ground surface (bgs) with variable groundwater flow directions.

Approximate depth to groundwater in the shallow aquifer ranges from 6 to 13.8 feet bgs. Shallow aquifer groundwater elevations range from approximately 22.8 to 28.5 feet above the City of Portland datum. In monitoring wells completed in the deep aquifer and transitional silty sand interbeds at the base of the aquitard, approximate depth to groundwater ranges from 7 to 17 feet bgs. Deeper groundwater elevations range from 19.7 to 27.5 feet above the City of Portland datum. Groundwater in the shallow aquifer flows toward the site from the west and splits into southerly and northerly flow beneath the site. The average linear groundwater velocity in the shallow aquifer is estimated to range from less than 550 ft/yr to 1,150 ft/yr. The vertical groundwater velocity across the aquitard is estimated to be 0.42 ft/yr. Groundwater flow in the deep gravel aquifer is variable with the most common flow direction to the north-northeast. Neither the shallow nor the deep aquifer is used as a drinking water source in the vicinity of the Univar facility.

3.0 PREVIOUS INVESTIGATIONS

Three phases of field investigation activities were performed between 1987 and 1992 in an attempt to characterize the subsurface conditions at the site. The Phase I and II field investigations are summarized in Section 2.3 of the RFI report (HLA, 1993). The Phase III investigation is detailed in Section 4.0 of the RFI report (HLA 1993). These investigations included collecting and analyzing surface soil samples at 64 locations; collecting and analyzing soil samples from 54 borings; performing two soil gas surveys; performing cone penetration tests; installing, sampling, and analyzing groundwater and soil gas samples from 23 groundwater and 4 soil gas monitoring wells; and performing aquifer tests. Quarterly and semiannual groundwater monitoring programs were implemented and are currently ongoing at the site to monitor groundwater flow and contaminant distribution and migration.

Since the RFI, supplementary site characterizations and interim corrective measures design were conducted at the north and south ends of the site, deep aquifer evaluations were performed at and to the east of deep well DMW-2 and a regional groundwater survey was coordinated. The results of these investigations are summarized in Section 2 of the CMS Report (PES 2006).

4.0 NATURE AND EXTENT OF CONTAMINATION

A brief summary of the nature and extent of contamination is presented below for soil and groundwater.

4.1 Soil

Surface soil samples were collected at 64 locations during the 1986 and 1987 Phase I and II investigations at the Univar site. Based on the operating history of the facility, the sampling and analyses focused on detection of volatile organics chemicals (VOCs). The primary VOCs detected in surface soil samples during these initial investigations were TCE and toluene. Results of the soil sampling indicated two main areas of surface soil impacted with VOCs: (1) adjacent to the northwest corner of the drum fill area extending north to the tank farm on the east side of the railroad spur and (2) in the vicinity of the former recycle area, approximately 75 feet west of the corrosives tank farm **(Figure 3)**.

4.2 Shallow Groundwater

The VOC plume in the shallow aquifer is centered in the west-central portion of the site (i.e., source area) and extends in the direction of groundwater flow toward the north and south-southeast **(Figure 4)**. Elevated concentrations of primary or parent chlorinated compounds (PCE, TCE, 1,1,1-TCA) are centered in the source area near monitoring well SMW-7, located adjacent to the northwest corner of the drum fill area, and generally decrease radially and downgradient. The aquitard beneath the shallow aquifer rises sharply to the east of the warehouse, restricting groundwater flow and contaminant transport to the east of the facility. Elevated concentrations of breakdown products (e.g., 1,2-DCE, 1,1-DCA, and vinyl chloride) extend further to the north and south, indicating natural degradation of the parent compounds and production and transport of the degradation products. Elevated concentrations of toluene are also present in the source area and extend to the south end of the facility.

As shown in **Figures 6, 7 and** 8, components of the VOC plume extend off site to the west along the entire length of the property. The plume extends off site to the north near SMW-11. At the south end of the site, the VOC plume extends toward SMW-8 and then appears to turn southeast along the property boundary and extends off site at SMW-23. At both the north (SMW-11) and south (SMW-23) ends of the facility, contaminant concentrations appear to decline to very low or nondetectable levels within several hundred feet of the property line. Since startup of the groundwater interim corrective measure (ICM) in March 2002, VOC concentrations near the downgradient edges of the plume have decreased.

4.3 Deep Aquifer

The nature and distribution of contaminants in groundwater in the deep aquifer is the subject of a supplemental investigation; the results of the initial phase of this investigation were submitted to EPA in a Deep Aquifer Report dated April 14, 2004 (PES, 2004). As documented in this report, contaminant concentrations were generally much lower in the deeper aquifer with the exception of monitoring well DMW-2 located directly beneath the source area. One of the objectives of the initial phase of the deep aquifer investigation was to determine whether the contaminants at this location are the result of a failed well seal as opposed to migration of contaminants through the aquitard. The Deep Aquifer Report concluded that a leaking or failed well seal was the most likely cause of the elevated levels of VOCs observed in DMW-2 and recommended abandoning this well. DMW-2 was properly closed in accordance with regulations in January 2005, and deep monitoring wells continue to be monitored as recommended in the Deep Aquifer Report. The report also recommended continuing quarterly water level monitoring and semi-annual water quality sampling.

5.0 EVALUATION OF RISK AND DEVELOPMENT OF CLEANUP LEVELS

In establishing cleanup levels under RCRA, EPA must ensure that contaminant concentrations do not pose risks to human health or the environment. Risk is evaluated for each potential exposure pathway based on consideration of current and reasonably expected future uses of the Facility and maximum beneficial use of ground water. Once the beneficial uses are determined, cleanup levels to protect those uses must be established. As described above, the Univar Facility is zoned heavy industrial and lies within an area designated as an Industrial Sanctuary in the City of Portland Comprehensive Plan.

5.1 Health and Environmental Assessment

The Health and Environmental Assessment (HEA) was conducted as part of the RFI and is included as Appendix G to the RFI Report (HLA, 1993). The HEA evaluated site soil and groundwater data to select chemicals of potential concern (COPCs) and to identify exposure pathways that were considered complete. As part of the CMS, certain portions of the HEA were updated based on data collected subsequent to preparation of the HEA. This updated information is presented in Appendix E of the CMS (PES, 2006) and was used as the basis for development of cleanup levels for the CMS.

5.2 Development of Cleanup Levels

Cleanup Levels (CULs) were calculated consistent with EPA Region 10 RCRA guidance (EPA, 1998) and the final Revised Technical Memorandum – Cleanup Level Determination Approach (ITC, 2001). Calculation of CULs involved the following steps:

- Identification of exposure pathways and receptors for developing CULs;

- Selection of COPCs;
- Calculation of screening levels (SLs);
- Selection of chemicals of concern (COCs); and
- Calculation of CULs for the COCs.

A detailed description of this process is provided in Appendix E of the CMS Report. A brief summary is provided below.

5.2.1 Exposure Pathways and Receptors

Based on the nature and extent of contamination summarized above and the documented uses of the site, surrounding areas, and groundwater, the following potential exposure pathways and receptors have been identified:

Soil

- Inhalation of vapors in a building by on-site office workers; and
- Dermal contact with contaminated subsurface soil by on-site trench workers.

Groundwater

- Inhalation of vapors in a building by on-site office workers;
- Inhalation of vapors in a building by off-site office workers; and
- Inhalation of vapors in a trench by off-site trench workers.

A summary of these pathways is shown in **Figure 5**.

5.2.2 Selection of Chemicals of Concern

A total of 33 COPCs were identified in the HEA conducted as part of the 1993 RFI (HLA, 1993) (**Table 1**). These COPCs were retained in both soil and groundwater and no additional screening for COPCs was performed.

To develop the final list of chemicals of concern (COCs) for the CMS, site data for the COPCs were compared to risk-based screening levels. The screening levels for soil and groundwater exposures are based on a 1 x 10^{-6} excess cancer risk and a hazard index (HI) of 0.1. The screening levels for the indoor air quality endpoints (i.e., office workers) were developed using the Johnson and Ettinger model (JEM) for subsurface vapor intrusion into buildings. The JEM is a screening-level model which incorporates both convective and diffusive mechanisms for estimating the transport of contaminant vapors emanating from either subsurface soils or groundwater into indoor spaces located directly above or in close proximity to the source of contamination.

The maximum concentration of each COPC was compared to its corresponding screening level. Maximum concentrations of soil COPCs were obtained from the HEA, combining surface and subsurface soil data. Maximum concentrations of COPCs in the shallow aquifer were obtained from the groundwater monitoring data for 2003.

If the maximum concentration of a COPC did not exceed any of its screening levels in a given medium (soil or groundwater), the chemical was eliminated from further consideration in that medium. Otherwise, the chemical was identified as a COC in that medium.

For certain chemicals found in soil, if the soil contamination is present above soil saturation concentrations non-aqueous phase liquids (NAPLs) may develop. These NAPLs may then migrate due to gravity flow.

As shown in Table 1, twenty COCs were selected for soil: ten based on vapor inhalation, eight based on both vapor inhalation and soil saturation, and two based on soil saturation only. Thirteen COCs were selected for groundwater, all based on vapor inhalation. No COPCs exceeded solubility limits in groundwater.

5.2.3 Calculation of Cleanup Levels

CULs were developed in two steps. In the first step, screening levels were adjusted up by a factor of 10 to create "Base CULs," which correspond to noncancer HIs of 1.0 and excess cancer risks of 1×10^{-5} for each individual chemical and each exposure pathway. In the second step, risks were distributed across multiple chemicals and, where applicable, multiple exposure pathways to ensure a total HI of 1.0 and a total cancer risk of 1×10^{-5}. CULs were developed for each of the three receptors identified above: the on-site office worker, the off-site office worker, and the off-site trench worker. Cleanup levels are exceeded in subsurface soil and in the shallow aquifer. Cleanup levels for soil are shown in **Table 2**. Cleanup levels for groundwater are shown in **Table 3**.

5.3 Corrective Action Objectives

Corrective Action Objectives (CAOs) form the basis for evaluating potential corrective technologies and actions for the site. CAOs are based on an evaluation of the data from the RFI and on the CULs determined as described above. The focus of the CAOs is protection of human health. No environmental receptors were identified in the HEA or subsequent evaluations.

5.3.1 Soil Corrective Action Objectives.

The CAOs for soil at the Univar facility are as follows:

- Prevent inhalation of vapors by indoor workers on site from soil containing COCs that exceed the applicable CULs so that target risk levels are not exceeded (i.e., HI less than 1 and excess cancer risk less than 1×10^{-5});

- Control incidental ingestion of and dermal contact with soil, and inhalation of particulates and vapors from soil, by trench workers on site by using appropriate monitoring and protective equipment;

- Control migration of non-aqueous phase liquid (NAPL) from shallow soil containing COCs above the saturation limit; and

- Minimize the potential for contaminants leaching from soil to groundwater.

5.3.2 Groundwater Corrective Action Objectives.

The CAOs for groundwater at the Univar facility are as follows:

- Prevent inhalation of vapors by indoor workers on or off site from groundwater containing COCs that exceed the applicable CULs so that target risk levels are not exceeded (i.e., HI less than 1 and excess cancer risk less than 1 x 10^{-5});

- Prevent inhalation of vapors by trench workers off site from groundwater containing COCs that exceed the applicable CULs so that target risk levels are not exceeded (i.e., HI less than 1 and excess cancer risk less than 1 x 10^{-5});

- Control inhalation of vapors from groundwater by trench workers on site by using appropriate monitoring and protective equipment;

- Prevent migration of COCs to the Willamette River; and

- Control or reduce the migration of COCs from on-site contamination source areas, to the extent practicable.

6.0 CORRECTIVE MEASURES STUDY

6.1 CMS Report

The primary purpose of the CMS Report is to document the process of developing and evaluating corrective action alternatives (CAAs) that address the contaminant releases identified at the site. This process consisted of three general steps:

- Identification and screening of technologies;
- Development of CAAs; and
- Evaluation of CAAs.

These three steps are summarized below.

6.1.1 Identification and Screening of Corrective Action Technologies

The potentially applicable technologies consider for the Univar facility are listed in **Table 4**. This list of technologies was compiled based on the nature of the contaminants at the facility (VOCs) , the environmental media impacted (soil and groundwater) and the types of exposures that need to be addressed (as defined by the CAOs listed in Section 5.3 above). In general, the technologies considered have been proven effective at other facilities.

Potentially applicable technologies were screened based on the estimated effectiveness, implementability, and overall applicability to the site. An uncertainty rating was included to reflect additional data or technology development that may be needed to demonstrate applicability to the Univar site. In general, technologies with a low overall applicability were screened out, and technologies with a medium or high applicability were retained. Of the 34 technologies considered, 21 were retained.

6.1.2 Development of Corrective Action Alternatives

CAAs are combinations of technologies designed to meet the CAOs. The retained technologies from the technology screening process were assembled into 11 preliminary CAAs that could treat or contain the contaminants in soil and groundwater, protect human health, control the residual contamination source, and reduce contaminant mass. These 11 CAAs were then evaluated (screened) based on the following general remedy performance standards to arrive at a final set of alternatives that would be evaluated in detail:

- Protect human health and the environment;
- Attain media cleanup objectives (for current and reasonably anticipated land and resource uses); and
- Remediate the sources of releases to reduce or eliminate further release that might pose threats to human health or the environment.

The baseline CAA (Alternative 1) was the continued operation of the existing SVE and groundwater ICMs. The remaining 10 CAAs included additional groundwater and/or soil treatment technologies to the ICM to develop a full range of alternatives.

Based on the CAA screening process, 6 of the 11 CAAs were retained for detailed development and evaluation. The retained CAAs are listed in the table below:

List of Retained CAAs

Alternative No.	Description
1	Groundwater ICM, Existing SVE, and Monitored Natural Attenuation. Serves as Baseline for comparisons
5	Groundwater ICM, Expanded SVE, Source Area Groundwater Extraction, and Monitored Natural Attenuation
6	Groundwater ICM, Expanded SVE, Expanded Source Area Groundwater Extraction, Source Area Air Sparging, and Monitored Natural Attenuation
7	Groundwater ICM, Expanded SVE, Expanded Source Area Groundwater Extraction, Source Area Steam Sparging, and Monitored Natural Attenuation
10	Groundwater ICM, Expanded SVE, Expanded Source Area Groundwater Extraction, Source Area *In situ* Oxidation, and Monitored Natural Attenuation
11	Groundwater ICM, Expanded SVE, Expanded Source Area Groundwater Extraction, Source Area *In situ* Enhanced Biodegradation, and Monitored Natural Attenuation

6.1.3 Detailed Evaluation of Corrective Action Alternatives

For the Univar site, the three general remedy performance standards listed above are addressed by the CAOs. For the 6 CAAs that meet the remedy performance standards, the detailed evaluation used the following balancing criteria:

- Long-term Reliability and Effectiveness;
- Reduction of Toxicity, Mobility, or Volume;
- Short-term Effectiveness;
- Implementability; and
- Cost.

The detailed evaluation was conducted in two stages. Each CAA was first compared individually to each of the criteria listed above. Next, the CAAs were compared against each other for each criteria.

7.0 DETAILS OF PROPOSED REMEDY

Based on the CAA development and evaluation process summarized above, EPA proposes that the final selected corrective measure be Alternative 5, which consists of the following components:

- **Expanded Source Area Soil Vapor Extraction –** The expanded SVE system would consist of approximately 24 to 30 new SVE wells. Approximately seven SVE wells would be installed between the solvent tank farm and the rail spur. Approximately 15 to 20 wells would be installed within the source area, and 3 wells would be installed along the northwest perimeter of the office building. It is estimated that the SVE system would produce between 10 and 40 cubic feet per minute (cfm) per well. To balance vapor treatment system size and operation-energy costs, it is likely that the wells would be cycled to maintain an approximate 200 to 400 cfm total vapor flow rate.

- **Source Area Groundwater Extraction** – Approximately three new groundwater extraction wells would be installed in the source area, each expected to be pumped at up to approximately 7 gallons per minute (gpm) to achieve capture of the source area plume. The groundwater ICM would continue operation to minimize off-site migration of VOCs from the site. Extracted groundwater would be treated using the ICM groundwater treatment system, which consists of an air stripper, pre-treatment and filtration, and off-gas vapor treatment systems. The primary purpose of the source-area groundwater pump-and-treat system would be to remove contaminant mass from the source area and to control groundwater gradients to minimize the migration of contaminants from the source area toward the perimeter ICM wells.

- **Natural Attenuation -** Natural attenuation processes are occurring at the site (Appendix C of the CMS), and will effect the overall performance of Alternative 5 by influencing contaminant distribution and migration and also by contributing to the overall destruction (i.e., mass removal) of contaminants. Over time the source control actions and operation of the ICM systems should result in a relatively stable and low concentration VOC plume at the site perimeter. At such time, implementation of a formal monitored natural attenuation (MNA) corrective action may be considered. If an MNA approach is proposed, Univar would be required to prepare a work plan developed consistent with applicable EPA policy and guidance documents at the time the work plan is developed. The workplan would be implemented after EPA approval.

- **Institutional Controls –** Institutional controls would be implemented to limit the use of shallow groundwater and restrict or place constraints on site activities such as excavation that could result in exposure. Institutional controls would remain in place until contaminant levels were below acceptable cleanup levels.

- **Engineering Controls –** The primary engineering control is maintaining paved surfaces at the site, which act as a barrier preventing direct contact and minimizing infiltration.

In order to potentially improve the performance of the SVE system and groundwater ICM, monitoring and continued investigation of the source area along with treatability studies would be performed. Based on the results of the source area investigation and treatability studies, and the performance of Alternative 5 over several years of operation, adjustments to the corrective actions would be evaluated for potential implementation in the source area.

7.1 Reduction of Risk and Attainment of Cleanup Levels:

Expansion of the SVE system and installation of new groundwater extraction wells in the source area would ensure immediate risk reduction by reducing the mass of contamination in the subsurface. Prevention of migration of VOC contaminants and restoration of groundwater would be accomplished and enhanced by implementation of the corrective measure. Institutional controls will further enhance the protectiveness of the measures described above by limiting exposure and controlling land and groundwater uses. The corrective measures would be in place until contaminant levels are below the risk-based cleanup levels.

This preferred corrective action approach:

- Meets the RCRA performance standards and the CAOs;
- Uses treatment of contaminants to address principal threats,
- Is effective in both the short and long terms;
- Controls the migration of contaminants from the source area;
- Provides significant mass reduction over time;
- Is implementable; and
- Is cost-effective.

8.0 OPPORTUNITY FOR PUBLIC COMMENT

EPA has prepared this Statement of Basis of its proposed decision regarding remedy selection. Public input on the proposed remedy and other alternatives considered, and information that supports the selection of that remedy, is an important contribution to the selection process. The final remedy selected could be different from the one that has been proposed, depending on the information that is received through the public participation process. After all public comments have been received and considered, EPA will make a final remedy determination. The administrative mechanism for implementation of corrective measures at the Univar facility is expected to be a modification to the existing AOC.

The Final Draft CMS Report and other project documents in the Administrative Record are available for review at the following locations:

In Portland

U.S. Environmental Protection Agency
Region 10 Operation Office
811 SW 6th Ave, 3rd Floor
Portland, OR 97204

In Seattle

U.S. Environmental Protection Agency
Region 10 Library
1200 Sixth Avenue, 10th Floor
Seattle, WA 98101
Hours: 9 AM – Noon and 1 – 2:30 PM Monday through Friday
Local Phone – (206) 553-1289
Toll free in Washington, Oregon, Idaho and Alaska – (800) 424-4EPA

In addition, the CMS Final Draft Report is also available online at ***insert link here*.**

To be considered in the decision process for this project, all comments on the proposed remedy selection must be received at the following address by September 22, 2006:

U.S. Environmental Protection Agency
Region 10
1200 Sixth Avenue, AWT-121
Seattle, WA 98101
Attention: Mr. Howard Orlean

EPA will consider holding a public meeting or hearing if there is sufficient interest. If you are interested in a public meeting please call Howard Orlean at (206) 553-2851 or email at orlean.howard@epa.gov prior to September 15, 2006.

9.0 REFERENCES

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United States Environmental Protection Agency (EPA), 1998. *Interim Final Guidance: Developing Risk-Based Cleanup Levels at Resource Conservation and Recovery Act Sites in Region 10*. EPA Region 10, Seattle, Washington. January.

United States Environmental Protection Agency (EPA), 1999. *Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites.* Office of Solid Waste and Emergency Response (OSWER) Directive 9200.4-17P. April 21.

Table 1
Chemicals of Potential Concern and Chemicals of Concern (COCs)
Corrective Measures Study
Univar USA Inc., Portland, Oregon

Chemical of Potential Concern	COC in Soil		COC in Ground Water	
	Vapors	Saturation	Vapors	Solubility
Acetone				
Arsenic				
Benzene	X		X	
Benzo(a)anthracene				
Benzo(b)fluoranthene		X		
Benzo(a)pyrene				
Bis(2-ethylhexyl)phthalate				
Bromoform				
Chloroform	X			
Chrysene				
1,1-Dichloroethane	X		X	
1,2-Dichloroethane	X			
1,1-Dichloroethene	X		X	
1,2-Dichloroethene (total)				
cis-1,2-Dichloroethene	X		X	
trans-1,2-Dichloroethene	X			
Ethylbenzene	X	X	X	
Indeno(1,2,3-cd)pyrene		X		
2-Methylbutane				
Methylene chloride	X	X	X	
4-Methy-2-pentanone				
Naphthalene				
Nickel				
Selenium				
Styrene	X			
Tetrachloroethene	X	X	X	
Thallium				
Toluene	X	X	X	
1,1,1-Trichloroethane	X	X	X	
1,1,2-Trichloroethane				
Trichloroethene	X	X	X	
Vanadium				
Vinyl chloride	X		X	
m-Xylene	X	X	X	
o-Xylene	X		X	
p-Xylene	X	X		
Xylenes (total)				
Totals	18	10	13	0

Table 2

Soil Cleanup Levels for On-Site Office Worker (milligrams/kilogram)

Univar USA Inc., Portland, Oregon

Soil Chemical of Concern	Vapor Pathway	Saturation Concentration
Benzene	0.007	NA
Benzo(b)fluoranthene	NA	4.0
Chloroform	0.001	NA
1,1-Dichloroethane	3.9	NA
1,2-Dichloroethane	0.003	NA
1,1-Dichloroethene	3.9	NA
cis-1,2-Dichloroethene	1.2	NA
trans-1,2-Dichloroethene	0.1	NA
Ethylbenzene	3.9	136
Indeno(1,2,3-cd)pyrene	NA	0.2
Methylene chloride	0.2	1,050
Styrene	2	NA
Tetrachloroethene	0.02	86
Toluene	13.9	230
1,1,1-Trichloroethane	12.7	460
Trichloroethene	0.002	623
Vinyl chloride	0.02	NA
m-Xylene	1.2	143
o-Xylene	1.2	141
p-Xylene	1.2	158
NA = not applicable (not a COC for this endpoint)		

Table 3

Groundwater Cleanup Levels (micrograms/liter)

Univar USA, Inc., Portland, Oregon

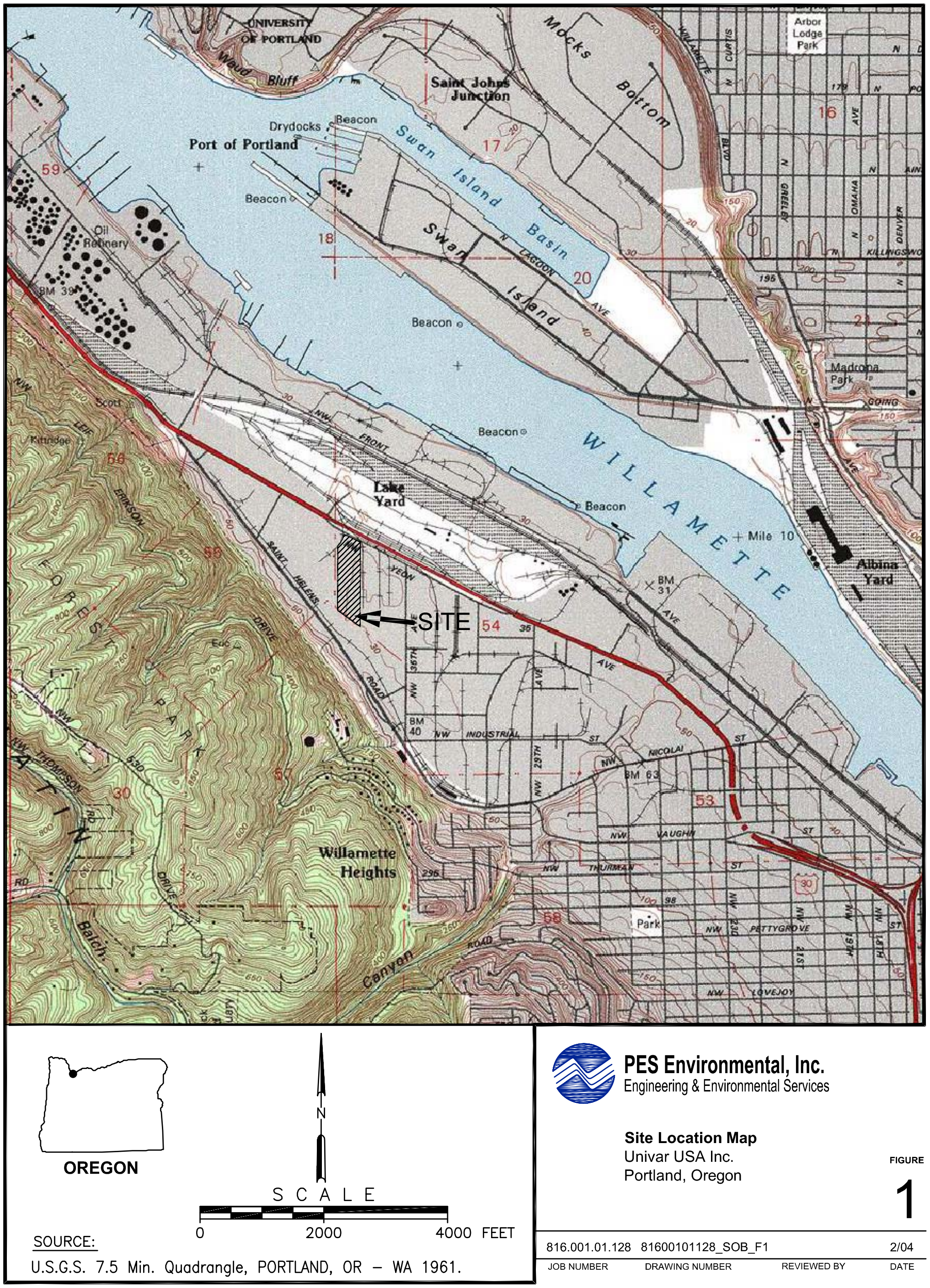
	Cleanup Levels Groundwater to Vapor Pathway		
Groundwater Chemicals of Concern	**On-Site Office Worker**	**Off-Site Office Worker**	**Off-Site Trench Worker**
1,1,1-Trichloroethane	495	618	3,140,000
1,1-Dichloroethane	335	428	2,190,000
1,1-Dichloroethene	144	50	144,000
Benzene	21	10	142,000
cis-1,2-Dichloroethene	522	423	2,160,000
Ethylbenzene	592	499	3,820,000
Methylene Chloride	157	34	4,710,000
m,p-Xylenes	361	508	3,860,000
o-Xylenes	326	696	507,000
Tetrachloroethene	24	5	155,000
Toluene	705	991	14,500,000
Trichloroethene	10	2	30,100
Vinyl chloride	233	7	34,000

Table 4

Potentially Applicable (Preliminary) Corrective Action Technologies

Univar USA Inc., Portland, Oregon

Technology Category	Preliminary Technology
Vadose-Zone Soil Treatment	**Monitored Natural Attenuation** **Soil Vapor Extraction (SVE)** **Bioventing** ***In-Situ* Flushing** **Thermal Enhanced SVE** **Excavation**
Hydraulic Control	**Groundwater Pumping** **Injection or Infiltration** **Containment Walls** **Reactive Barriers**
Biological Treatment	**Monitored Natural Attenuation** **Enhanced Aerobic Biodegradation** **Enhanced Anaerobic Biodegradation** **Cometabolic Biodegradation**
Chemical/Physical Treatment	**Air Sparging** **Steam Stripping** **Soil Heating** **Dual-Phase Extraction** ***In-Situ* Oxidation**
Treatment of Extracted Groundwater	**Air Stripping** **Activated Carbon** **Biological Treatment** **Oxidation**
Disposal of Treated Water	**Discharge to Surface Water (NPDES)** **Discharge to POTW** **Land Application**
Treatment of Air Emissions	**Activated Carbon (on-site regeneration)** **Activated Carbon (off-site regeneration)** **Catalytic Oxidation** **Thermal Oxidation** **Resin Adsorption**
Institutional and Engineering Controls	**Water- and Land-Use Restriction** **Access Restrictions** **Engineering Controls**



PES Environmental, Inc.
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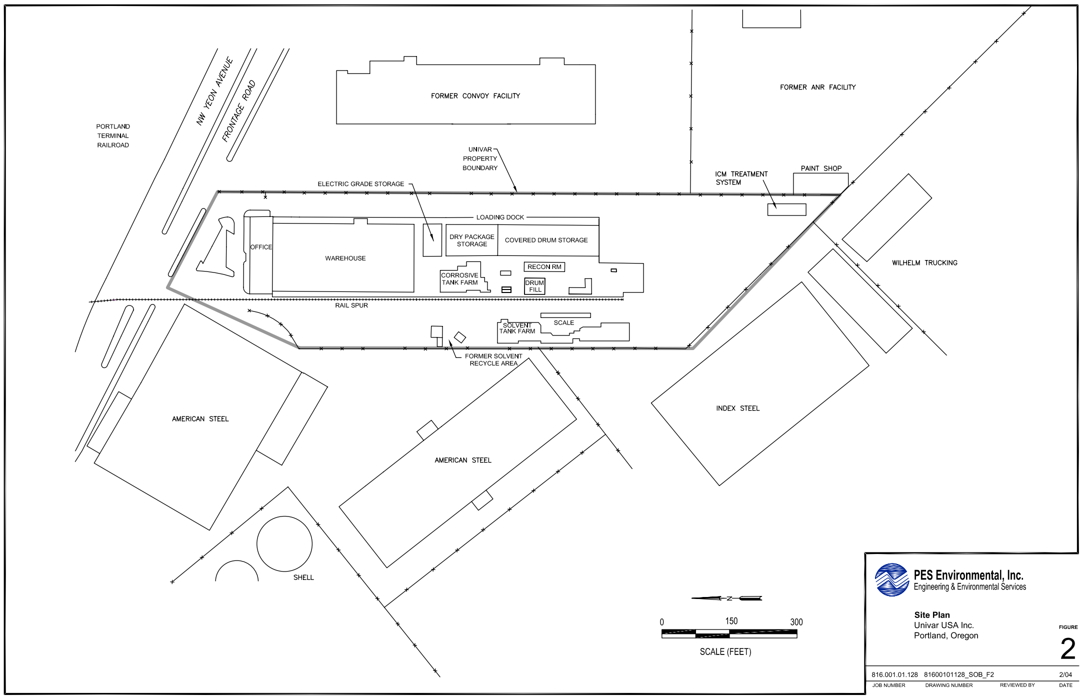
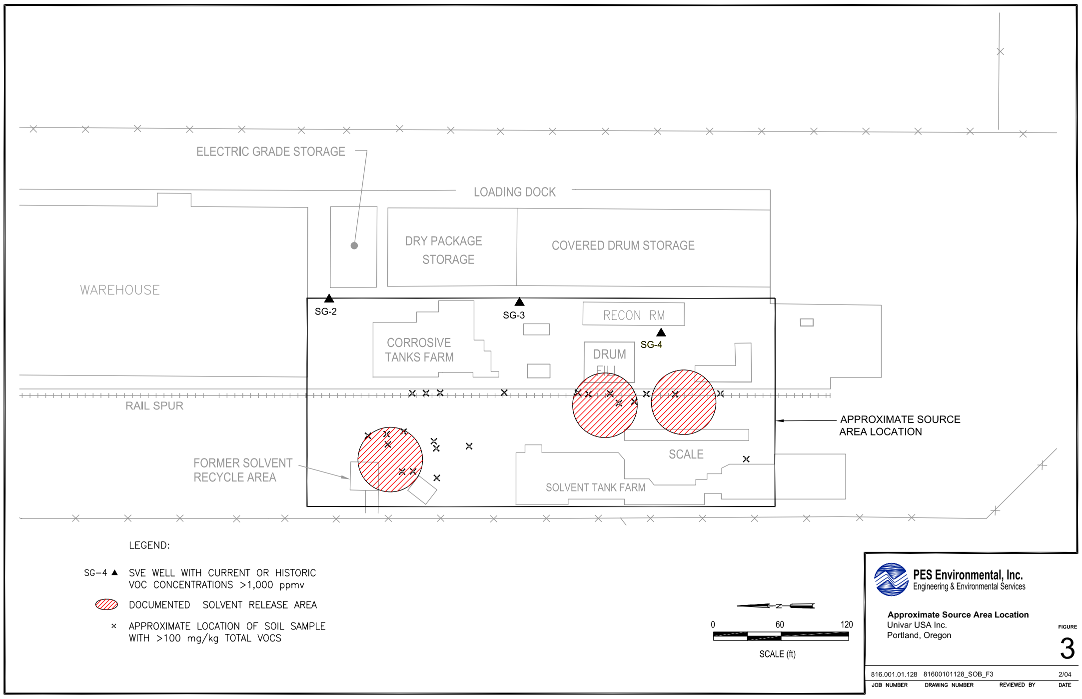
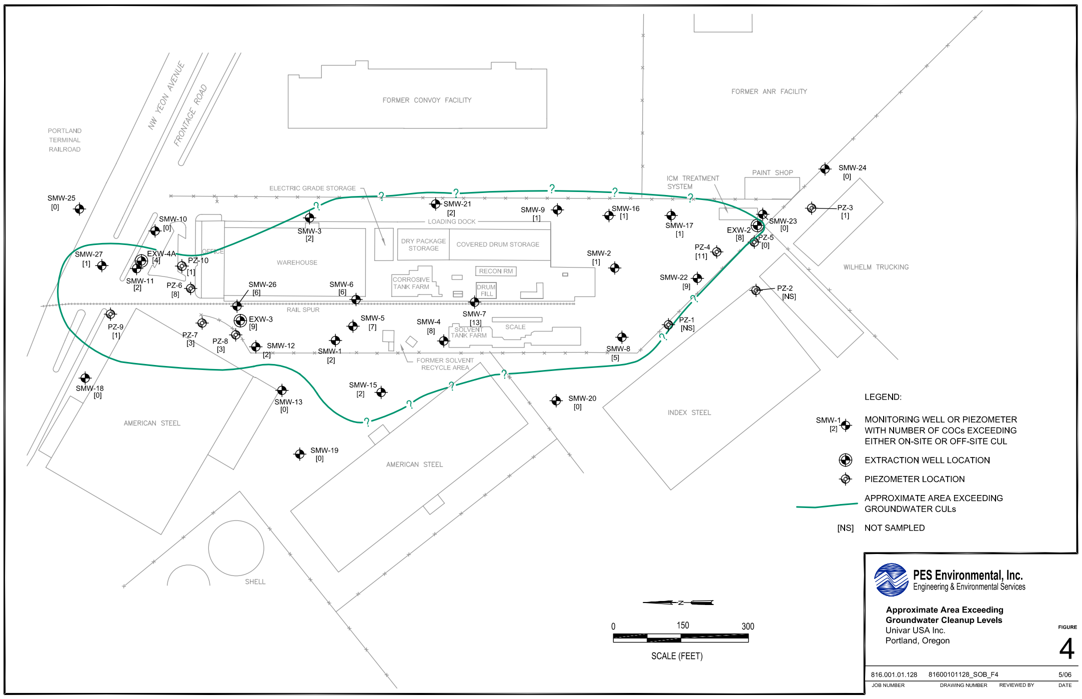
Site Location Map
Univar USA Inc.
Portland, Oregon

FIGURE
1

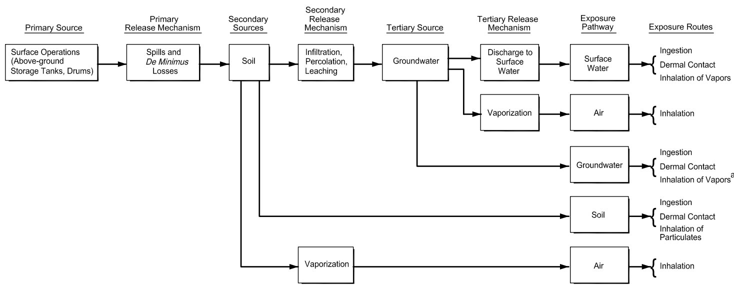
JOB NUMBER	DRAWING NUMBER	REVIEWED BY	DATE
816.001.01.128	81600101128_SOB_F1		2/04


FORMER CONVOY FACILITY
FORMER ANR FACILITY
PORTLAND
TERMINAL
RAILROAD
NW YEON AVENUE
FRONTAGE ROAD
UNIVAR
PROPERTY
BOUNDARY
ELECTRIC GRADE STORAGE
ICM TREATMENT
SYSTEM
PAINT SHOP
LOADING DOCK
OFFICE
WAREHOUSE
DRY PACKAGE
STORAGE
COVERED DRUM STORAGE
RECON RM
CORROSIVE
TANK FARM
DRUM
FILL
WILHELM TRUCKING
RAIL SPUR
SOLVENT
TANK FARM
SCALE
FORMER SOLVENT
RECYCLE AREA
AMERICAN STEEL
INDEX STEEL
AMERICAN STEEL
SHELL
0
150
300
SCALE (FEET)
PES Environmental, Inc.
Engineering & Environmental Services
Site Plan
Univar USA Inc.
Portland, Oregon
FIGURE
2
816.001.01.128
81600101128_SOB_F2
2/04
JOB NUMBER
DRAWING NUMBER
REVIEWED BY
DATE


ELECTRIC GRADE STORAGE
LOADING DOCK
DRY PACKAGE STORAGE
COVERED DRUM STORAGE
WAREHOUSE
SG-2
SG-3
RECON RM
SG-4
CORROSIVE TANKS FARM
DRUM FILL
RAIL SPUR
APPROXIMATE SOURCE AREA LOCATION
FORMER SOLVENT RECYCLE AREA
SCALE
SOLVENT TANK FARM
LEGEND:
SG-4 ▲ SVE WELL WITH CURRENT OR HISTORIC VOC CONCENTRATIONS >1,000 ppmv
DOCUMENTED SOLVENT RELEASE AREA
× APPROXIMATE LOCATION OF SOIL SAMPLE WITH >100 mg/kg TOTAL VOCS
N
0 60 120
SCALE (ft)
PES Environmental, Inc.
Engineering & Environmental Services
Approximate Source Area Location
Univar USA Inc.
Portland, Oregon
FIGURE
3
816.001.01.128
81600101128_SOB_F3
2/04
JOB NUMBER
DRAWING NUMBER
REVIEWED BY
DATE



FORMER CONVOY FACILITY
FORMER ANR FACILITY
PORTLAND TERMINAL RAILROAD
NW YEON AVENUE
FRONTAGE ROAD
ELECTRIC GRADE STORAGE
ICM TREATMENT SYSTEM
PAINT SHOP
LOADING DOCK
OFFICE
WAREHOUSE
DRY PACKAGE STORAGE
COVERED DRUM STORAGE
RECON RM
CORROSIVE TANK FARM
DRUM FILL
RAIL SPUR
SOLVENT TANK FARM
SCALE
FORMER SOLVENT RECYCLE AREA
WILHELM TRUCKING
INDEX STEEL
AMERICAN STEEL
AMERICAN STEEL
SHELL
SMW-25 [0]
SMW-10 [0]
SMW-27 [1]
EXW-4A [4]
SMW-11 [2]
PZ-10 [1]
PZ-6 [8]
SMW-3 [2]
SMW-21 [2]
SMW-9 [1]
SMW-16 [1]
SMW-17 [1]
SMW-2 [1]
SMW-26 [6]
SMW-6 [6]
SMW-7 [13]
EXW-3 [9]
PZ-9 [1]
PZ-7 [3]
PZ-8 [3]
SMW-12 [2]
SMW-1 [2]
SMW-5 [7]
SMW-4 [8]
SMW-8 [5]
SMW-18 [0]
SMW-13 [0]
SMW-15 [2]
SMW-19 [0]
SMW-20 [0]
SMW-22 [9]
PZ-4 [11]
EXW-2 [8]
PZ-5 [0]
SMW-23 [0]
SMW-24 [0]
PZ-3 [1]
PZ-2 [NS]
PZ-1 [NS]
LEGEND:
SMW-1 [2] MONITORING WELL OR PIEZOMETER WITH NUMBER OF COCs EXCEEDING EITHER ON-SITE OR OFF-SITE CUL
EXTRACTION WELL LOCATION
PIEZOMETER LOCATION
APPROXIMATE AREA EXCEEDING GROUNDWATER CULs
[NS] NOT SAMPLED
N
0 150 300
SCALE (FEET)
PES Environmental, Inc.
Engineering & Environmental Services
Approximate Area Exceeding
Groundwater Cleanup Levels
Univar USA Inc.
Portland, Oregon
FIGURE
4
816.001.01.128
81600101128_SOB_F4
5/06
JOB NUMBER
DRAWING NUMBER
REVIEWED BY
DATE



	POTENTIAL RECEPTORS							
	CURRENT		FUTURE					
	On-Site	Off-Site	On-Site		Off-Site			
Exposure Pathway / Route	Office Worker	Office Worker	Office Worker	Trench Worker	Office Worker	Trench Worker	Resident	Ecological
Surface Water – Ingestion							Q	Q
Surface Water – Dermal Contact							Q	Q
Surface Water – Inhalation of Vapors							Q	Q
Air – Inhalation	X	X	X	Q	X	X		
Groundwater – Ingestion					Q		Q	
Groundwater – Dermal Contact					Q		Q	
Groundwater – Inhalation of Vapors[a]					Q		Q	
Soil – Ingestion				Q				
Soil – Dermal Contact				Q				
Soil – Inhalation of Particulates				Q				
Air – Inhalation	X		X	Q				

LEGEND:
Q Qualitative Evaluation
X Quantitative Evaluation (Cleanup Levels)

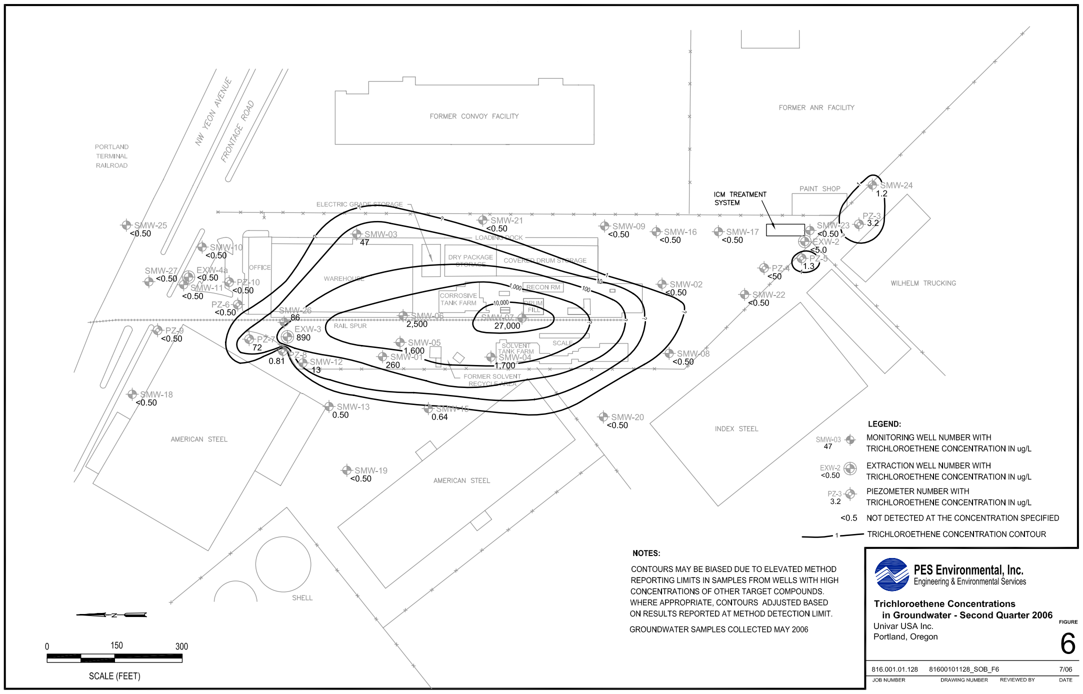
FOOTNOTE:
a From Household use , such as showering.

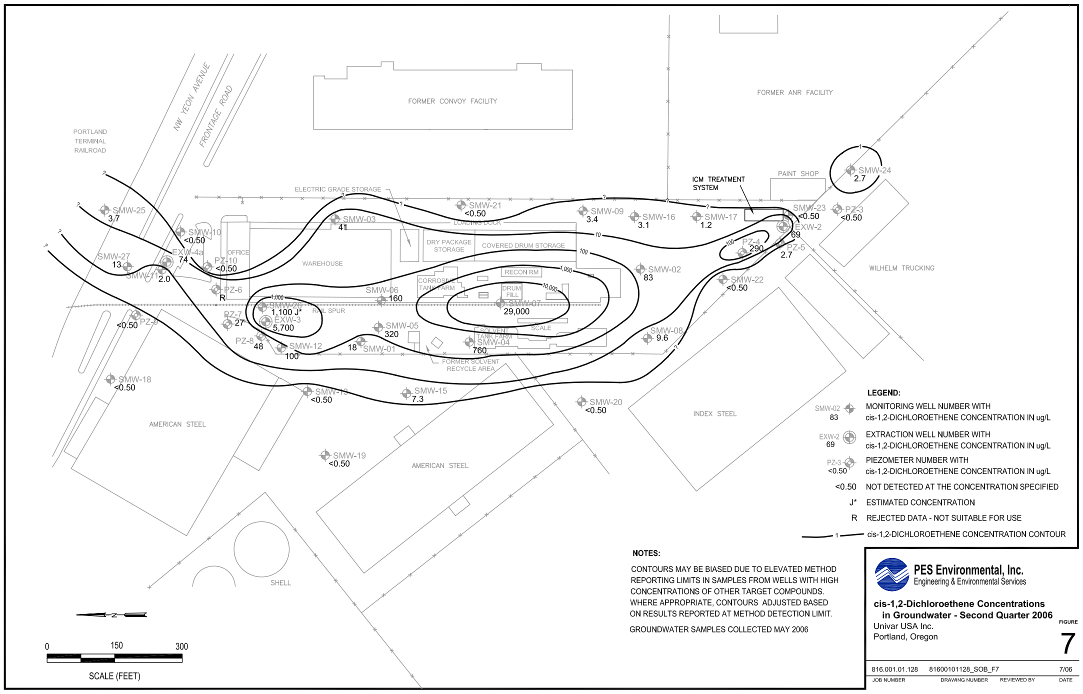
PES Environmental, Inc.
Engineering & Environmental Services

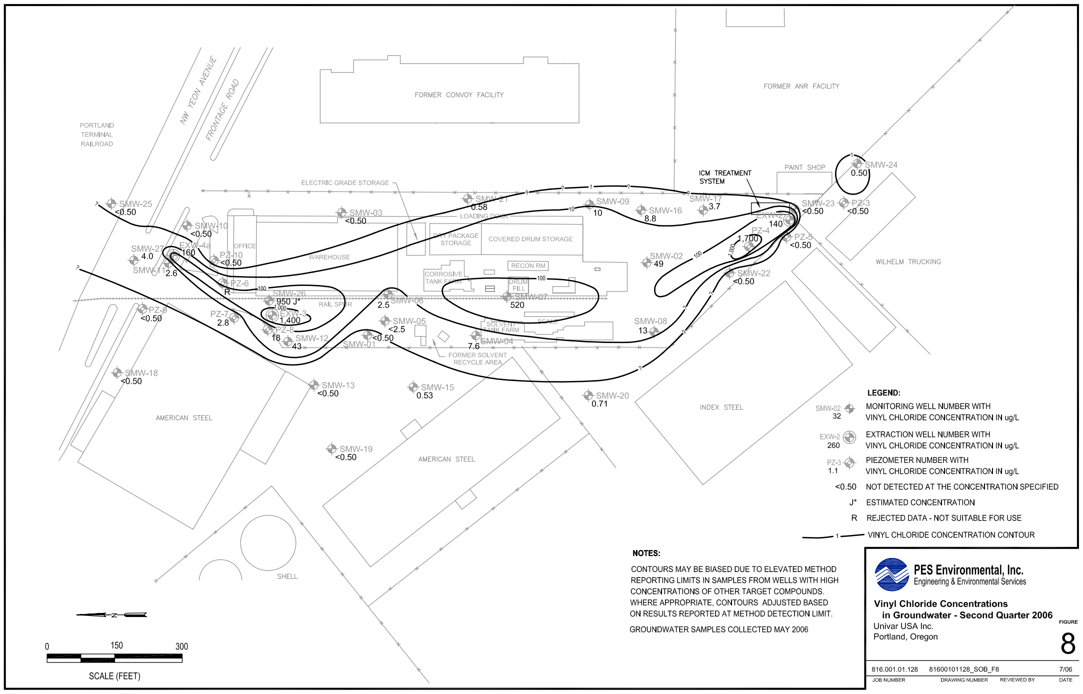
Conceptual Site Model
Univar USA Inc.
Portland, Oregon

FIGURE
5

JOB NUMBER	DRAWING NUMBER	REVIEWED BY	DATE
816.001.01.128	81600101128_SOB_F5		2/04


LEGEND:
MONITORING WELL NUMBER WITH TRICHLOROETHENE CONCENTRATION IN ug/L
EXTRACTION WELL NUMBER WITH TRICHLOROETHENE CONCENTRATION IN ug/L
PIEZOMETER NUMBER WITH TRICHLOROETHENE CONCENTRATION IN ug/L
<0.5 NOT DETECTED AT THE CONCENTRATION SPECIFIED
TRICHLOROETHENE CONCENTRATION CONTOUR
NOTES:
CONTOURS MAY BE BIASED DUE TO ELEVATED METHOD REPORTING LIMITS IN SAMPLES FROM WELLS WITH HIGH CONCENTRATIONS OF OTHER TARGET COMPOUNDS. WHERE APPROPRIATE, CONTOURS ADJUSTED BASED ON RESULTS REPORTED AT METHOD DETECTION LIMIT.
GROUNDWATER SAMPLES COLLECTED MAY 2006
PES Environmental, Inc.
Engineering & Environmental Services
Trichloroethene Concentrations in Groundwater - Second Quarter 2006
Univar USA Inc.
Portland, Oregon
FIGURE
6
816.001.01.128
81600101128_SOB_F6
7/06
SCALE (FEET)
FORMER CONVOY FACILITY
FORMER ANR FACILITY
AMERICAN STEEL
INDEX STEEL
WILHELM TRUCKING
SHELL


FORMER CONVOY FACILITY
FORMER ANR FACILITY
PORTLAND TERMINAL RAILROAD
NW YEON AVENUE
FRONTAGE ROAD
ICM TREATMENT SYSTEM
PAINT SHOP
WILHELM TRUCKING
WAREHOUSE
OFFICE
DRY PACKAGE STORAGE
COVERED DRUM STORAGE
FORMER SOLVENT RECYCLE AREA
INDEX STEEL
AMERICAN STEEL
SHELL
SMW-24
2.7
SMW-23
<0.50
PZ-3
<0.50
EXW-2
69
PZ-4
290
PZ-5
2.7
SMW-25
3.7
SMW-10
<0.50
EXW-4a
74
PZ-10
<0.50
SMW-27
13
2.0
PZ-6
R
SMW-03
41
SMW-21
<0.50
SMW-09
3.4
SMW-16
3.1
SMW-17
1.2
SMW-02
83
SMW-22
<0.50
SMW-06
160
SMW-07
29,000
SMW-26
1,100 J*
EXW-3
5,700
PZ-7
27
PZ-8
48
SMW-12
100
SMW-01
18
SMW-05
320
SMW-04
760
SMW-08
9.6
PZ-9
<0.50
SMW-18
<0.50
<0.50
SMW-15
7.3
SMW-20
<0.50
SMW-19
<0.50
LEGEND:
SMW-02 83 MONITORING WELL NUMBER WITH cis-1,2-DICHLOROETHENE CONCENTRATION IN ug/L
EXW-2 69 EXTRACTION WELL NUMBER WITH cis-1,2-DICHLOROETHENE CONCENTRATION IN ug/L
PZ-3 <0.50 PIEZOMETER NUMBER WITH cis-1,2-DICHLOROETHENE CONCENTRATION IN ug/L
<0.50 NOT DETECTED AT THE CONCENTRATION SPECIFIED
J* ESTIMATED CONCENTRATION
R REJECTED DATA - NOT SUITABLE FOR USE
1 cis-1,2-DICHLOROETHENE CONCENTRATION CONTOUR
NOTES:
CONTOURS MAY BE BIASED DUE TO ELEVATED METHOD REPORTING LIMITS IN SAMPLES FROM WELLS WITH HIGH CONCENTRATIONS OF OTHER TARGET COMPOUNDS. WHERE APPROPRIATE, CONTOURS ADJUSTED BASED ON RESULTS REPORTED AT METHOD DETECTION LIMIT.
GROUNDWATER SAMPLES COLLECTED MAY 2006
0 150 300
SCALE (FEET)
PES Environmental, Inc.
Engineering & Environmental Services
cis-1,2-Dichloroethene Concentrations in Groundwater - Second Quarter 2006
Univar USA Inc.
Portland, Oregon
FIGURE
7
816.001.01.128
81600101128_SOB_F7
7/06
JOB NUMBER
DRAWING NUMBER
REVIEWED BY
DATE


FORMER CONVOY FACILITY
FORMER ANR FACILITY
PORTLAND TERMINAL RAILROAD
NW YEON AVENUE
FRONTAGE ROAD
ELECTRIC GRADE STORAGE
ICM TREATMENT SYSTEM
PAINT SHOP
WAREHOUSE
COVERED DRUM STORAGE
RECON RM
RAIL SPUR
FORMER SOLVENT RECYCLE AREA
WILHELM TRUCKING
AMERICAN STEEL
INDEX STEEL
SHELL
LEGEND:
MONITORING WELL NUMBER WITH VINYL CHLORIDE CONCENTRATION IN ug/L
EXTRACTION WELL NUMBER WITH VINYL CHLORIDE CONCENTRATION IN ug/L
PIEZOMETER NUMBER WITH VINYL CHLORIDE CONCENTRATION IN ug/L
<0.50 NOT DETECTED AT THE CONCENTRATION SPECIFIED
J* ESTIMATED CONCENTRATION
R REJECTED DATA - NOT SUITABLE FOR USE
VINYL CHLORIDE CONCENTRATION CONTOUR
NOTES:
CONTOURS MAY BE BIASED DUE TO ELEVATED METHOD REPORTING LIMITS IN SAMPLES FROM WELLS WITH HIGH CONCENTRATIONS OF OTHER TARGET COMPOUNDS. WHERE APPROPRIATE, CONTOURS ADJUSTED BASED ON RESULTS REPORTED AT METHOD DETECTION LIMIT.
GROUNDWATER SAMPLES COLLECTED MAY 2006
SCALE (FEET)
0 150 300
PES Environmental, Inc.
Engineering & Environmental Services
Vinyl Chloride Concentrations in Groundwater - Second Quarter 2006
Univar USA Inc.
Portland, Oregon
FIGURE 8
816.001.01.128 81600101128_SOB_F8 7/06
JOB NUMBER DRAWING NUMBER REVIEWED BY DATE